

Effect of ergot contaminated diets fed to piglets and chickens

S. Mainka¹, S. Dänicke¹, J. Wolff², H. Böhme¹, G. Flachowsky¹

¹ Institute of Animal Nutrition, Federal Agricultural Research Centre (FAL), D- Braunschweig

² Institute for Biochemistry of Cereals and Potatoes, Federal Centre for Cereal, Potato and Lipid Research (BAGKF), D- Detmold



1. Introduction

The toxicity of ergot (*Claviceps purpurea*) is primarily due to the included alkaloids. Few information is found in the literature on ergot ingestion as depending on the alkaloid content and pattern. To contribute to this subject two primarily tests were conducted with piglets and chickens to study the influence of feeding ergot specified concerning alkaloid content and pattern on growth performance and health.

2. Materials and Methods

- Dose / Response- experiments with piglets and chickens fed sclerotia of *Claviceps purpurea* (Rye harvest 2002)
- Ergot from one source was used in both experiments
- Treatments of 5 incorporation levels of ergot in both trials (Table 1)
- Sclerotia were milled (1mm) and homogenised

Table 1: Parameters of the experiments

	Piglets	Chickens
Animals	40 castrated males and 40 females (BHZP)	140 males (LOHMANN MEAT)
Groups	5 x 16 animals	5 x 28 animals
Ergot concentration in the diets	I 0 % II 0,05 % III 0,1 % IV 0,2 % V 0,4 %	
Age and live weight range	5 th - 10 th week of life 8 - 22 kg	1 st - 21 st day of life 43 - 718 g
Housing	Flatdecks 4 animals per pen	Cages 4 animals per cage
Feed / water	Ad libitum	
Composition of the diets	Wheat, barley, maize, soybeanmeal solv. extr.; fed unpelleted	Wheat, maize, full fat soybeanmeal, soybeanmeal solv. extr.; fed unpelleted
Formulation	Isoenergetic and isonitrogenic, corresponding to recommendations of DLG, 1991 GfE, 1999	
Recorded data	Live weight per animal and feed consumption per pen once a week	

- The chickens were weighed and slaughtered on the day after finishing the trial. Weights of liver, heart, spleen and bursa fabricii were registered from all animals.
- The content of alkaloids in ergot were determined applying the HPLC-technique as described by WOLFF et al. (1988).

3. Results

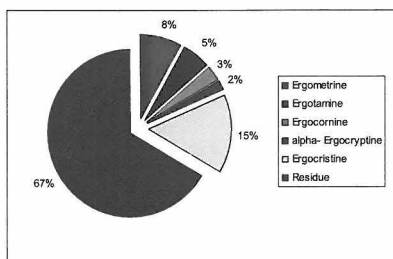


Figure 1: Alkaloid pattern of the used ergot having a total alkaloid content of 279 µg / 100 mg

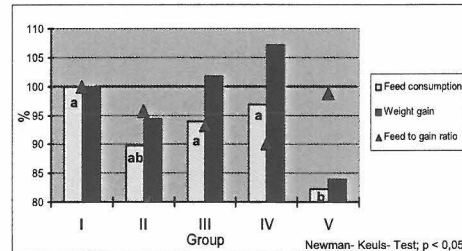


Figure 2: Growth performance of the piglets relative to controls

- A content of 0.4 % ergot in the diet decreased feed intake and growth performance of piglets significantly.

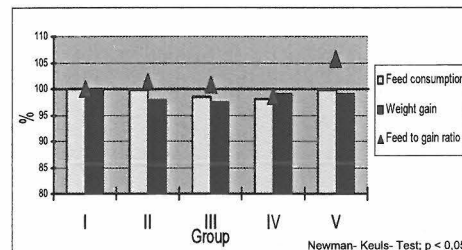


Figure 3: Growth performance of the chickens relative to controls

- In the study conducted with chickens significant effects of feeding ergot on growth performance were not detected.
- Mortality rate in the groups I, II, III and IV was 0 %. 3 animals of group V dropped out during the experiment. One chicken died on 2nd day of living. No diagnostic findings were observed. One animal was killed on 5th day of living because of leg problems. The diagnose was a multi-organ collapse. Two days before the end of the trial another chicken was killed due to leg problems. The autopsy did not show the real cause.

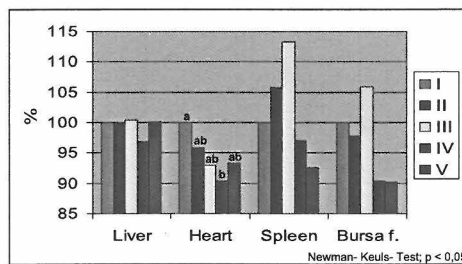


Figure 4: Organ weights of chickens of the ergot fed groups II – V (in % of live weight) as compared to the control group I (100 %)

- With increased ergot concentrations in the diet the weight of hearts decreased, which proved to be significant only at a level of 0.2 % ergot in the diet. Directed effects on the weight of other organs (liver, spleen and bursa fabricii) as affected by the ergot concentration were not observed.
- Further studies with ergot from other sources differing in alkaloid content and pattern are necessary to evaluate toxic alkaloid levels for the various animal species or categories.

References:

- DLG (1991) *Futterwerttabelle für Schweine*. Aufl.6. DLG-Verlag, Frankfurt/M.
- GfE (1999) *Energie- und Nährstoffbedarf landwirtschaftlicher Nutztiere, Nr. 7: Legehennen und Masthühner*. DLG-Verlag, Frankfurt/M.
- WOLFF, J.; NEUDECKER, Ch.; KLUG, Ch.; WEBER, R. (1988): *Chemische und toxikologische Untersuchungen über Mutterkorn in Mehl und Brot*. Z. Ernährungswiss. 27, 1 – 22.

We thank the *Lochow Petkus GmbH*, Bergen for ergot providing.



Federal Ministry
of Consumer Protection,
Food and Agriculture

Sonderheft 271
Special Issue



Landbauforschung
Völkenrode
FAL Agricultural Research

Workshop

**A Positive List of feedstuffs as a contribution to
feed safety —
Expectations, concepts and solutions**

edited by
Uwe Petersen and Gerhard Flachowsky

Workshop in the Forum of the Federal Agricultural Research
Centre (FAL), September 4th and 5th, 2003
initiated by the Federal Ministry of Consumer Protection,
Food and Agriculture